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*Practical Education.* By CHARLES G. LELAND. London, Whitaker. 12°.

THIS is an essentially vicious book. In these days, when all enlightened educators are calling for meat, it is an outrage to offer them such a stone as this. It is the more vicious because it is offered in the guise of a contribution to the literature of the new education. Some things in it are good, many are nonsensical, and all are superficial. There is no grasp of education shown in it, no psychological power, and no connected account of any successful practical experience. The number of times that the words 'I,' 'my,' 'mine,' 'me,' etc., occur is sufficiently numerous — or sufficiently innumerable — to characterize the work. It contains no reference, at least no intelligent reference, to the manual-training movement which is revolutionizing the American schools and the traditional course of study. It offers no suggestions as to the co-ordination in various grades of schools of 'industrial-art education' and the ordinary studies.

We fear that the title of this book may commend it to the attention of many who are conscientiously studying contemporary educational thought. We warn such readers that Mr. Leland's book is superficial, that it is crude, that it is representative of no important educational movement. Some of the points on which the author touches are in themselves commendable, and have been taken up by other writers. When this has happened, they have usually been based on some educational principle. With the author of this book they seem to be mere 'flashes in the pan.' He has not discovered that an 'art-writer' and an 'educator' are not necessarily convertible terms.

#### NOTES AND NEWS.

THE first number of the journal of the American Folk-Lore Society, which was recently organized, has just been issued under the title *The Journal of American Folk-Lore*. It shows how much work may be accomplished by a society of this character, and that the establishment of a centre for collecting the fast-vanishing remains of American lore was a necessity. The journal is devoted to the study of the relics of Old English lore, as well as to that of the Indians, negroes, and other immigrants, and the first number contains articles on each of these subjects. Prof. T. F. Crane contributes a paper on the theory of the diffusion of popular tales, while H. Carrington Bolton gives an interesting collection of the counting-out rhymes of children. The general editor, Mr. W. W. Newell, studies the alleged Vaudoux (Voodoo) worship and child-sacrifice in Hayti, and arrives at the conclusion that it is the old superstition regarding the Waldenses that has been transplanted to America. The Vaudoux of Hayti are the Waldenses of France, the word having been introduced in the seventeenth century; and the alleged practices of the latter are now ascribed to the Vaudoux. The second half of the volume is devoted to Indian lore. Dr. D. G. Brinton gives some remarks on the Lenâpé, Rev. W. M. Beauchamp relates tales of the Onondaga, while Rev. J. Owen Dorsey and Dr. F. Boas have articles on myths and customs of Dakota and British Columbian tribes. Much interesting and valuable information has been collected in the 'Folk-Lore Scrap-Book,' and students will find the bibliographical notes very useful. The first number of the journal augurs well for the development and usefulness of the society.

— Records of about 3,500 orders received by A. A. Marks, New York, for an artificial arm or leg are found sufficiently full to enable them to be tabulated for statistical purposes. Of all the artificial limbs made by the firm, 85 per cent are legs, and 15 per cent arms. This small percentage for arms may be explained by the fact that fewer persons who have lost their arms supply themselves with artificials than those who have lost their lower extremities, inasmuch as it is easier for a man to go through this world with one arm than with one leg; and, besides, an artificial arm for amputation above the elbow is of so little service, aside from appearance, that few persons with amputations above the elbow ever use them. Taking these facts into consideration, the percentages referring to arms cannot be regarded of very much value in estimating the comparative restorations of the upper and lower extremities. Of all the legs taken into consideration, 49 per cent are right, 46 per cent are left, and 5

per cent both. The above figures show that the proportion of right legs amputated to left is nearly even, with the small difference of three per cent in favor of the right. Seventy-eight per cent of legs amputated are of males, and twenty-two per cent of females. The proportion for double amputations of males is nearly double that of females. This may be explained by the fact that males are more frequently placed in jeopardy than females. Over one-half of all the amputations are between the knee and ankle, with a larger percentage for males. Of all the arms manufactured by the firm, ninety-two per cent are for males, and eight per cent for females.

— A. H. Worthen, State geologist of Illinois, is dead.

— Mrs. Emma W. Hayden has given to the Academy of Natural Sciences of Philadelphia, in trust, the sum of twenty-five hundred dollars, to be known as the Hayden Memorial Geological Fund, in commemoration of her husband, the late Prof. Ferdinand V. Hayden, LL.D. According to the terms of the trust, a bronze medal, and the balance of the interest arising from the fund, are to be awarded annually for the best publication, exploration, discovery, or research in the sciences of geology and paleontology, or in such particular branches thereof as may be designated. The award, and all matters connected therewith, are to be determined by a committee to be selected in an appropriate manner by the academy. The recognition is not to be confined to American naturalists.

— Two living buffaloes, the gift of Fish Commissioner Blackford of this city have been added to the small collection of animals gathered in the Smithsonian grounds in Washington during the past few months. A bill has already been introduced into Congress for the purchase of a large tract of the beautiful suburban lands lying along Rock Creek, just outside of the city limits of Washington, and the establishment upon it of a government zoölogical garden. The bill may not be passed this year, but the few living animals now in possession of the National Museum are no doubt the nucleus of what will in a few years be a very important national zoölogical collection. Professor Hornaday has been made curator of living animals.

— An exhibition of the first year's industrial work in the Washington public schools will be given at the close of the present month. Professor Powell, the superintendent, does not expect to make as brilliant a display as that recently made in Philadelphia, and in other cities where manual training was introduced earlier; but he will show astonishing results, when it is considered that only five thousand dollars has been spent in fitting up shops and cooking-schools, and a year's expenses, including materials used, and that the pupils whose work will be exhibited have had instruction only one hour a week for a year.

— A geographical society has been formed in Peru for the purpose of collecting and publishing information regarding Peru. The society, which will be known by the name 'Geographical Society of Lima,' counts a number of eminent explorers and scientists of South America among its founding members.

— The Government of Ontario is about to take more energetic measures for the development of its mines, and as a preliminary step has appointed a royal commission to inquire into and report upon the subject. Members of the commission are Dr. R. Bell of the Canadian Geological Survey; W. H. Merritt, mining engineer; W. Coe, proprietor of the Madoc iron-mines; and A. Blue, deputy minister of agriculture; while John Charlton is chairman.

#### LETTERS TO THE EDITOR.

\* \* Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.

Twenty copies of the number containing his communication will be furnished free to any correspondent on request.

The editor will be glad to publish any queries consonant with the character of the journal.

#### Is the Rainfall increasing on the Plains?

MR. CURTIS does a service in calling attention to the serious error in the rainfall record of Fort Leavenworth for January, 1871 and 1872. It is to be hoped that any errors of this kind will be similarly pointed out.

The data on secular variation in rainfall, p. 19, *Monthly Weather Review* for April, 1887, show, however, that, even with these errors corrected, the rainfall at Leavenworth for the past twenty-five years has been considerably greater than for the previous twenty-five years. There is no doubt that material errors existed in the old records, some of which are due to neglect or falsification of records, while others, as in this case, are due to gross carelessness.

Rainfall data are now being collated by the Signal Office with a view to their examination and discussion; but the more the records are examined, the more possible it seems that observations prior to 1870 should be neglected, except in cases of well-known and reliable observers.

A. W. GREELY.

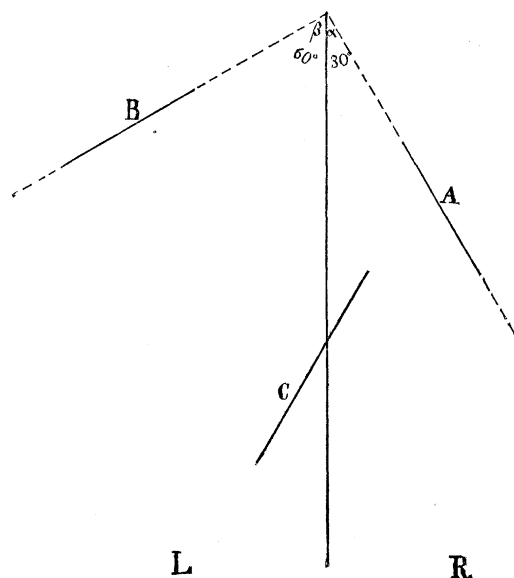
Washington, D.C., May 12.

### Disparate Vision.

MR. HYSLOP'S experiments in physiological optics as detailed in *Science*, Nos. 261, 262, and 274, are interesting in that they show the importance of monocular perceptions in attaining what we may think to be binocular effects, even though they may not fully disprove the generally accepted theory of corresponding retinal points. Having devoted much time to this subject (see *American Journal of Science* for November and December, 1881, March, April, May, October, and November, 1882), I may perhaps claim some practice in experiments of this kind. The result of former investigations was my total abandonment of the geometric considerations which formed an integral part of Brewster's theory of binocular vision, and which have been repeated time and again since his day. The empiristic theory, as developed by Helmholtz, seems more consistent with the more general theory of evolution now universally accepted as fundamental in biology. According to this, we rapidly learn in infancy to interpret our binocular perceptions by experience that is too complex for analysis. Assuming a certain inherited structure for the retina, which is alike for the majority of individuals of the race, it remains possible to modify our perceptions slightly by training; and it would not be safe to deny that in exceptional cases binocular perceptions may result from simultaneous impressions on retinal points that are decidedly disparate. I have elsewhere adduced arguments to show that no strictly mathematical interpretation can be put upon the theory of corresponding points (*American Journal of Science*, May, 1882, p. 355 *et seq.*). The perception of the third dimension in space without any of the aids resulting from shading, comparison, or motion, has lately been shown to be quite possible with monocular vision alone (*American Journal of Psychology*, November, 1887, p. 99, article on the Horopter, by Mrs. Franklin). I had no difficulty in attaining this monocular perception in repeating Mrs. Franklin's experiments.

But although constrained to assign much greater potency to monocular vision than was customary after the stereoscope became generally known and used, and although our interpretation of binocular perception has to be much more elastic than it formerly was, there seems to be not yet sufficient ground for the belief that any large part of our binocular perceptions are the result of impression on pairs of retinal points that are widely disparate. The same perception may be changed by force of will or of imagination, and with various degrees of success by the same person at different times. Without denying the validity of Mr. Hyslop's perceptions, I do not succeed in getting exactly his results. Combining the two circles by either convergent or divergent vision, the binocular effect is an ellipse whose plane is perpendicular to the meridian plane only when their inclinations to this plane are equal. This perception is rigidly binocular. Let, now, their inclinations be different. For example: let the plane of the circle *A* make an angle of  $30^\circ$  with the meridian plane, and *B* an angle of  $60^\circ$ , the two being seen by cross-vision. In the accompanying diagram the cards are supposed to be seen edgewise, the two eyes being at *R* and *L*. The plane of the resultant ellipse changes about to the position *C*; the horizontal axis, which was previously the shorter one, becoming now much longer than the vertical axis, which has remained unchanged. The projection of the circle *A* on the retina *L* is quite a narrow ellipse, while that of *B* on the retina *R* is almost if not quite circular, the vertical diameters of these ellipses being nearly equal. At the top and bottom of the resultant ellipse the perception may be due to impression on corresponding

retinal points, while for other parts the impression is on disparate points. Very little attention is required to perceive the separate monocular images. By still further diminishing the angle  $\alpha$  and increasing  $\beta$ , a limit is reached at which binocular fusion ceases to be possible. Two ellipses are seen, apparently crossing each other in space about where *C* was; the plane of one being nearly parallel to *A*, and that of the other nearly parallel to *B*. By indirect monocular vision, *A* is still seen by the right eye, and *B* by the left. The locality of the crossed ellipses is not so definite as was that of the binocular ellipse; but the illusion of suspension in space still remains, and with it is the monocular perception of the third dimension in space. Even when  $\alpha$  is very nearly equal to  $\beta$ , it is possible by rivalry of retinal impressions to gain or lose monocular perceptions alternately with binocular resultants. But the clearness of the binocular illusions is more pronounced than that of the monocular in proportion as the separation of the disparate points impressed becomes less. It is fair to conclude that binocular vision is at its best when there is perfect correspondence of at least a goodly proportion of the retinal points impressed, and but slight separation of disparate points. But it is quite necessary, in the majority of cases, that there shall be some such disparateness. The mental effect produced is instantaneous. Since double images, whether homonymous or heteronymous, are rarely ever perceived except as



the result of special ocular training, and since the binocular perception of depth in space may result where one element may, on geometric grounds, be considered to be combined with other elements: so as to produce at the same instant both homonymous and heteronymous double images (*American Journal of Science*, October, 1882, p. 5), binocular vision is far from being so simple and easy of explanation as it seemed to the students of forty years ago.

W. LECONTE STEVENS.

Brooklyn, N.Y., May 5.

### Agriculture and Late Quaternary Geology.

IN view of the effort now being made to endow the United States Geological Survey with the means of carrying into effect the "classification of lands" called for in the act creating it, it may be of interest to record one out of many instances where this classification, in connection with agricultural phenomena, affords information equally interesting to the geologist and the farmer.

At a late visit to the upper San Joaquin valley for the purpose of locating on a representative soil a culture experiment station under the Hatch Act, the writer was under the necessity of obtaining a cross-section of the great valley in the latitude of Tulare City, from Lake Tulare on the west, to the foot-hills of the Sierra Nevada on the east.

The dark-tinted loam-deposits at present forming on the edge of that lake being already familiar, it was easy to recognize in the 'black-lands' belt, that begins about two miles westward of the